

**ABSTRACT**

An interference spectroscopy instrument provides simultaneous measurement of specular scattering over multiple wavelengths and angles. The spectroscopy  
5 instrument includes an interference microscope illuminated by Koehler illumination and a video camera located to image the back focal plane of the microscope's objective lens while the path-length difference is varied between the reference and object paths. Multichannel Fourier analysis transforms the resultant intensity  
10 information into specular reflectivity data as a function of wavelength. This multitude of measured data provides a more sensitive scatterometry tool having superior performance in the measurement of small patterns on semiconductor devices and in measuring overlay on such devices.

15